

DAQ Event Steering Issues for the FY04 Run

Tonko Ljubicic
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DAQ100 Issues

- Which events have clusters
- Which events have zero-suppressed (ZS) data
- Which events have both

L2 Issues

- Which detectors send data to L2
- Which events get sent to L2

L3 Issues

- Which events get sent to L3

DAQ100 Issues (TPC only)

- “DAQ100” mode of running is assumed:
 - 1) Every event participates in cluster finding
 - 2) Smaller fractions of events have zero-suppressed data tagged on as well (in addition to clusters!).
- For efficiency reasons I need to know *immediately in the frontend* which event “wants” ZS data!
- Information I have is only:
 - 1) Token
 - 2) “DAQ Command”
- Token can be used in lieu of the “event counter” for sampling i.e. every time $(\text{Token} \% \text{ZSmodulus}) == 0$ this event will have the ZS component.
- “DAQ Command” should be set to i.e. 4 for the class of trigger types which need ZS data i.e. for very rare events where one does not trust the FCF clusterfinder.

Questions

- 1) Which (if any) trigger classes should have SZ data by default
- 2) What should be the sampling rate of unbiased events with ZS data (not really a Trigger issue but anyway...)

Digression:

One does not want to use ZS casually due to the overhead in DAQ.
A rough rule is that one ZS event is worth ~5 clusters-only events so i.e. a sampling rate of “every 10th” incurs a 30% penalty:

I.e. your “time” spent is for 10+5 events but you get only 10 events out.
30 % (= 5/15) is just overhead.

L3 Issues

- This run's assumptions:
 - 1) L3 never aborts
 - 2) STAR needs to continue to have a visual of the TPC for a (small) sample of events.
 - 3) Certain *classes of triggers* will use L3 for processing where L3 will decide if this event goes into the “express stream” (separate data file where these events will be copied into).

Proposal

a) visual monitoring is done on a rate basis

DAQ will deliver a certain rate of (unbiased) events to L3. This rate will be settable via RC and is **expected to be ~ 1 Hz**. *Only events where either TPC or BTOW are present will be delivered.*

b) The events from the trigger class (set in RC) which have a “L3 algorithm” associated with them will be passed to L3 in all cases.

It is expected that the rate of such events will be small (**< 10 Hz**). *Only events where both the TPC and BTOW are in will be passed in this way.*

L2 Issues

- Certain detectors (notably BTOW) are used as a source for L2 algorithms so their data must be passed to the L2 processor from DAQ.
- Those detectors **must have** an L2_ACCEPT issued via the TCU as soon as possible after the initial trigger gets fired. They also **must never** be ABORTed!
- Event-by-event steering can possibly be done using the “DAQ Command” field.

Issues

- 1) Apart from BTOW any other detectors? ETOW? ESMD?
- 2) Do we need event-by-event steering via the “DAQ Command”?
- 3) There should be a parameter in RC to determine if a detector will/won't participate in L2 for this run configuration.

We may not want to burden the system/L2 during runs where we don't care about L2 but care about high rates to storage (i.e. some BTOW calibration runs, etc).